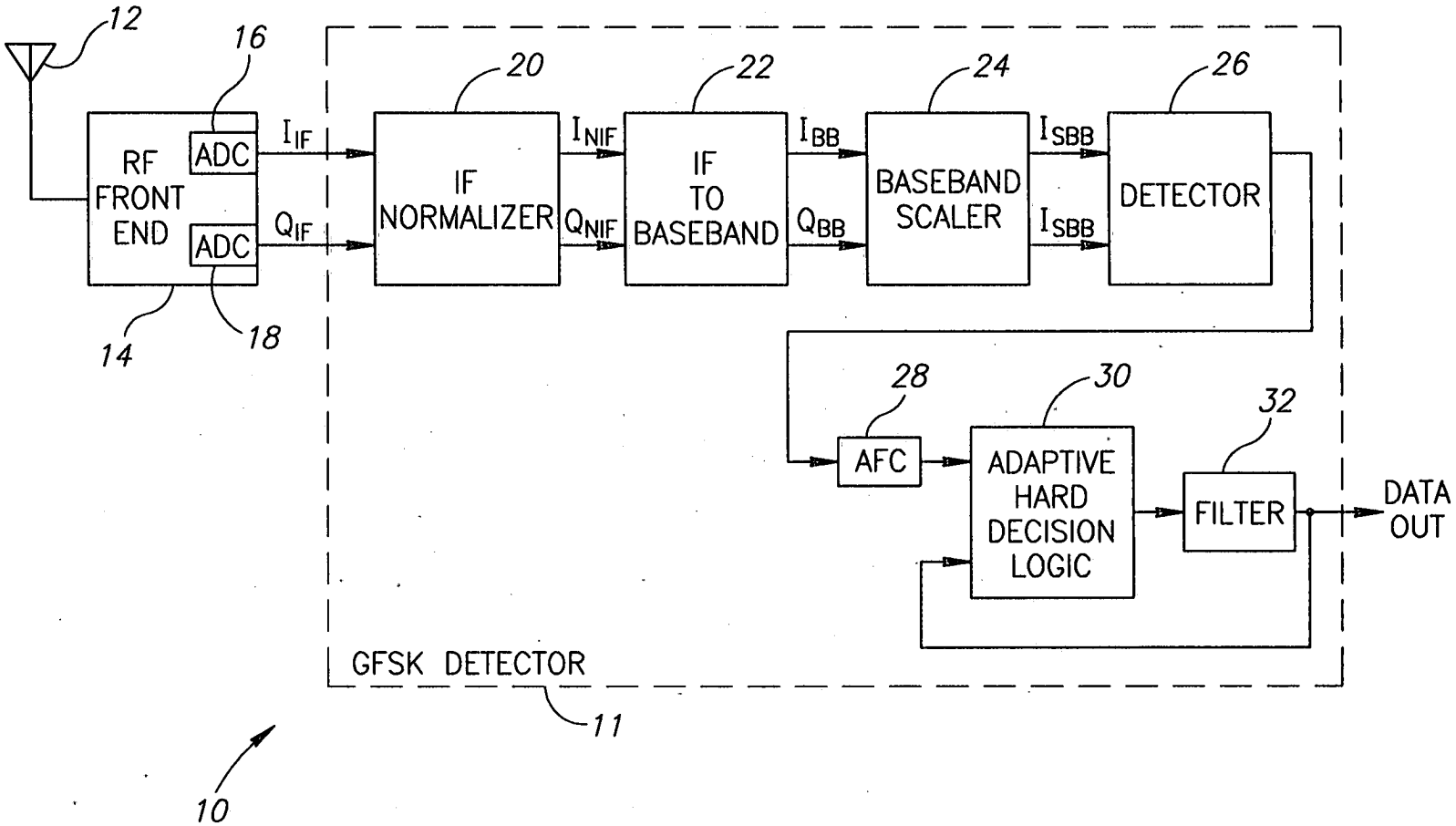
12
16
20
22
24
26
RF
FRONT
END
ADC
ADC
I_{IF}
Q_{IF}
IF
NORMALIZER
I_{NIF}
Q_{NIF}
IF
TO
BASEBAND
I_{BB}
Q_{BB}
BASEBAND
SCALER
I_{SBB}
I_{SBB}
DETECTOR
14
18
28
30
32
AFC
ADAPTIVE
HARD
DECISION
LOGIC
FILTER
DATA
OUT
GFSK DETECTOR
11
10

FIG.1

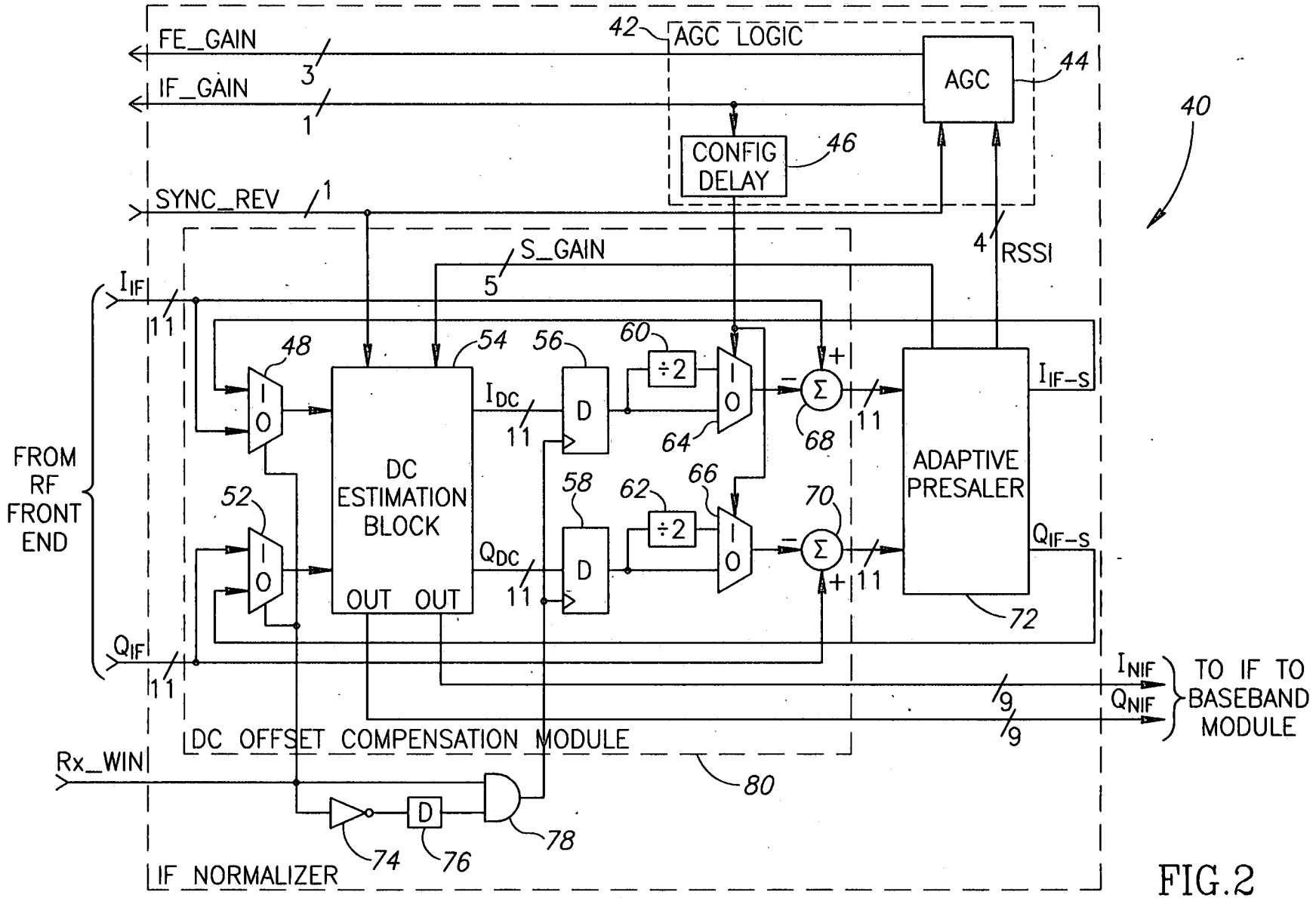
FE_GAIN
3
IF_GAIN
1
42
AGC LOGIC
AGC
44
40
CONFIG DELAY
46
SYNC_REV
1
4
RSSI
S_GAIN
5
I_{IF}
11
48
54
56
60
÷2
I_{DC}
11
D
64
68
11
I_{IF-S}
ADAPTIVE PRESALER
FROM RF FRONT END
52
DC ESTIMATION BLOCK
OUT OUT
58
62
66
70
÷2
Q_{DC}
11
D
11
Q_{IF-S}
72
Q_{IF}
11
I_{NIF}
Q_{NIF}
9
9
TO IF TO BASEBAND MODULE
DC OFFSET COMPENSATION MODULE
80
Rx_WIN
74
D
76
78
IF NORMALIZER

FIG.2

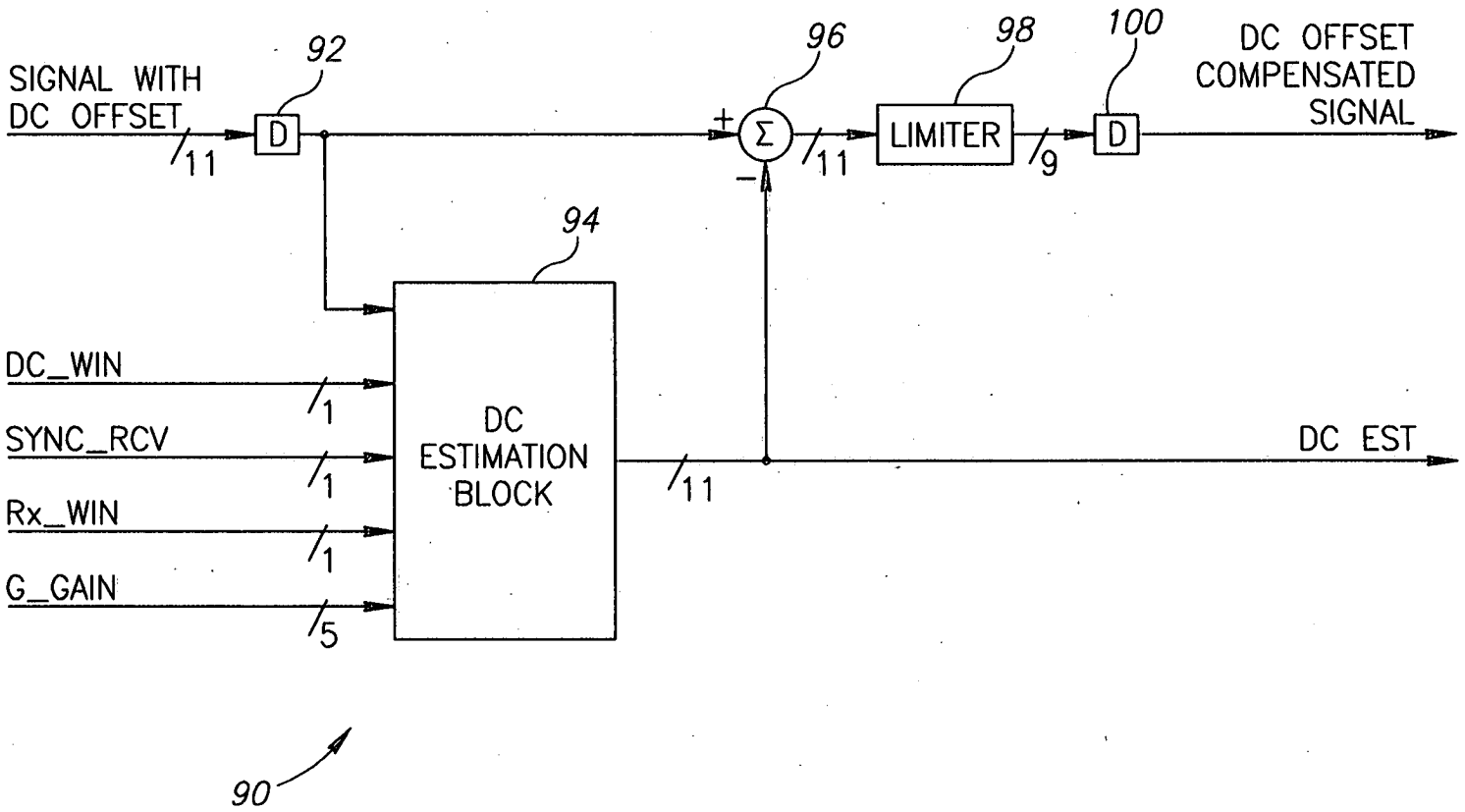
SIGNAL WITH
DC OFFSET
11
92
D
96
+
Σ
−
11
98
LIMITER
9
100
D
DC OFFSET
COMPENSATED
SIGNAL
94
DC_WIN
1
SYNC_RCV
1
Rx_WIN
1
G_GAIN
5
DC
ESTIMATION
BLOCK
11
DC EST
90

FIG.3

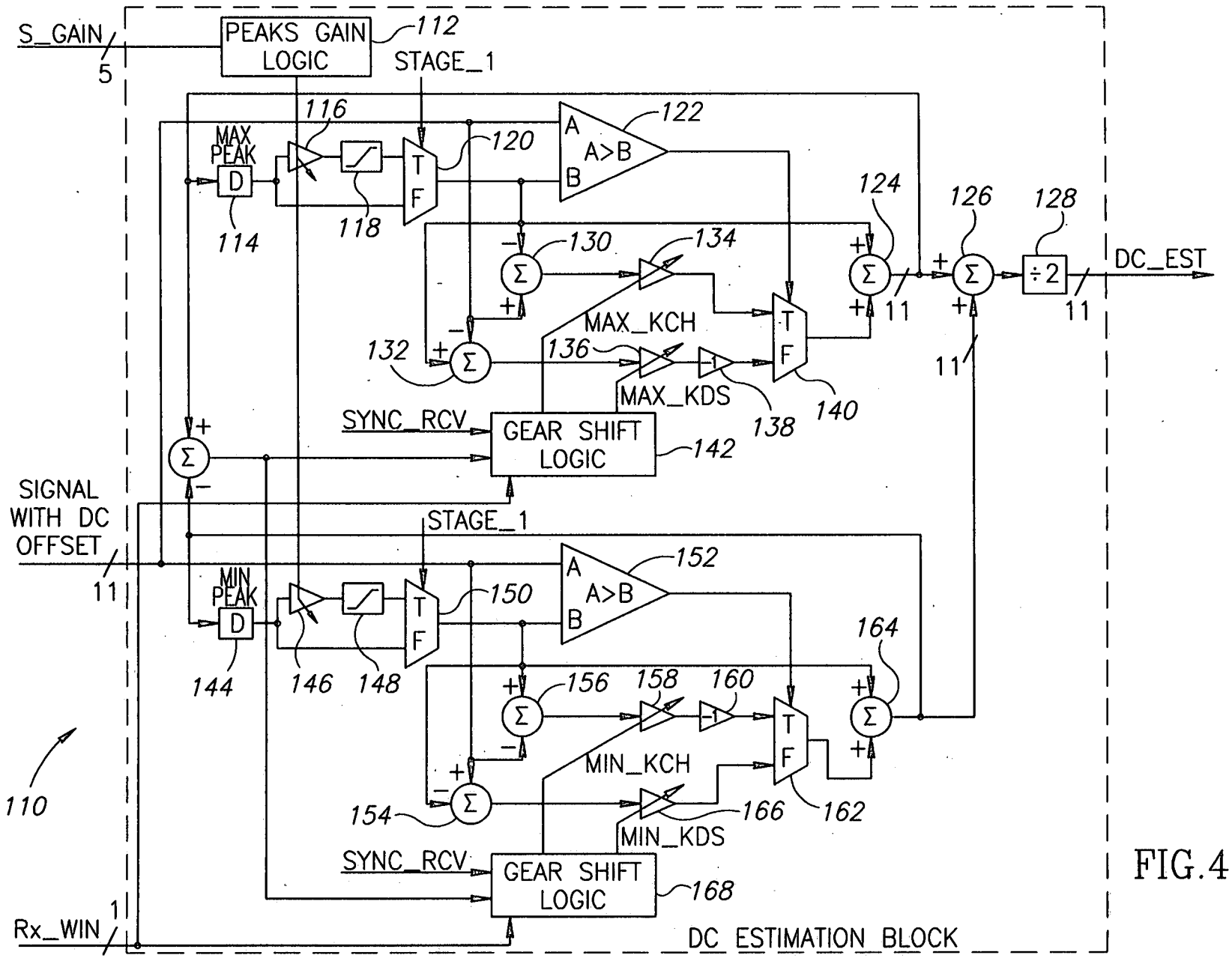
S_GAIN
5
PEAKS GAIN LOGIC
112
STAGE_1
116
MAX PEAK
D
114
118
T F
120
A
B
A>B
122
124
126
128
÷2
DC_EST
11
130
134
MAX_KCH
132
136
MAX_KDS
138
140
SYNC_RCV
GEAR SHIFT LOGIC
142
SIGNAL WITH DC OFFSET
11
STAGE_1
MIN PEAK
D
144
146
148
150
152
156
158
160
164
MIN_KCH
154
166
162
MIN_KDS
SYNC_RCV
GEAR SHIFT LOGIC
168
110
Rx_WIN
1
DC ESTIMATION BLOCK

FIG.4

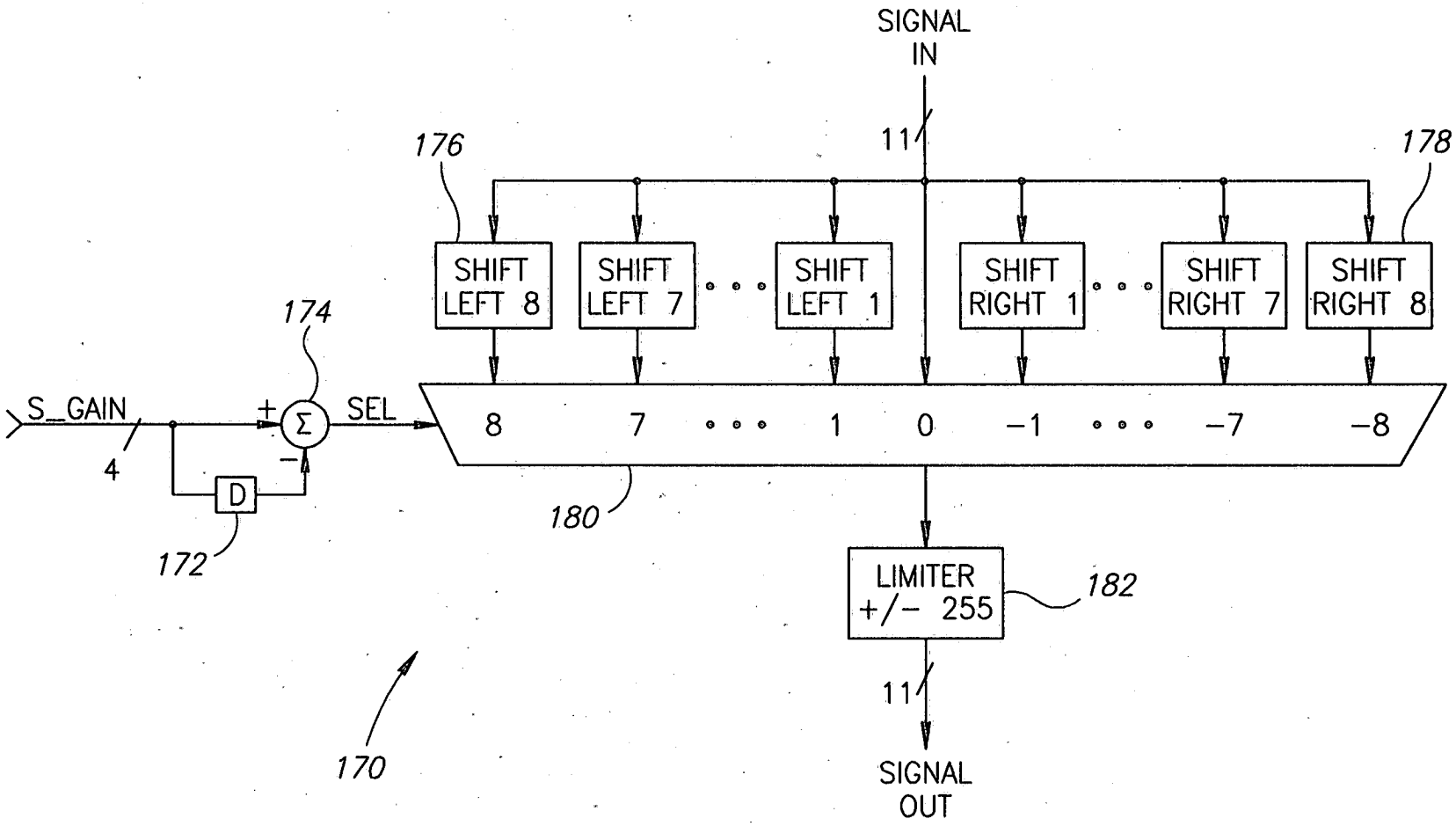
SIGNAL
IN
11
176
178
SHIFT
LEFT 8
SHIFT
LEFT 7
SHIFT
LEFT 1
SHIFT
RIGHT 1
SHIFT
RIGHT 7
SHIFT
RIGHT 8
174
S_GAIN
4
+
Σ
−
SEL
D
172
8
7
1
0
−1
−7
−8
180
LIMITER
+/− 255
182
11
SIGNAL
OUT
170

FIG.5

LISTING 1

```
IF BEFORE_RX_START
        MAX_KCH = 2^-2;
        MAX_KDS = 2^-9;          % THIS IS STAGE 1. IN THIS
        MIN_KCH = 2^-2;          STAGE NO LIMITING IS REQUIRED
        MIN_KDS = 2^-9;

ELSE
    IF AFTER_SYNC
        MAX_KCH = 2^-7;
        MAX_KDS = 2^-8;          % THIS IS STAGE 3. IN THIS
        MIN_KCH = 2^-7;          STAGE THE MECHANISM IS QUIET
        MIN_KDS = 2^-8;

    ELSE
        MAX_KCH = 2^-2;
        MAX_KDS = 2^-8;          % THIS IS STAGE 2. IN THIS
        MIN_KCH = 2^-2;          STAGE WE WORK ON SCALED SIGNALS
        MIN_KDS = 2^-8;

    END
    IF (MAX_PEAK(K)-MIN_PEAK(K)) >512
        MAX_KDS = 2^-4;          % THE LIMITERS HAVE
        MIN_KDS = 2^-4;          PRECEDENCE IN
                                 DETERMINING COEFFICIENTS

    ELSEIF (MAX_PEAK(K)-MIN_PEAK(K)) <100
        MAX_KCH = 2^-4;
        MIN_KCH = 2^-4;
    END
END
```

FIG.6

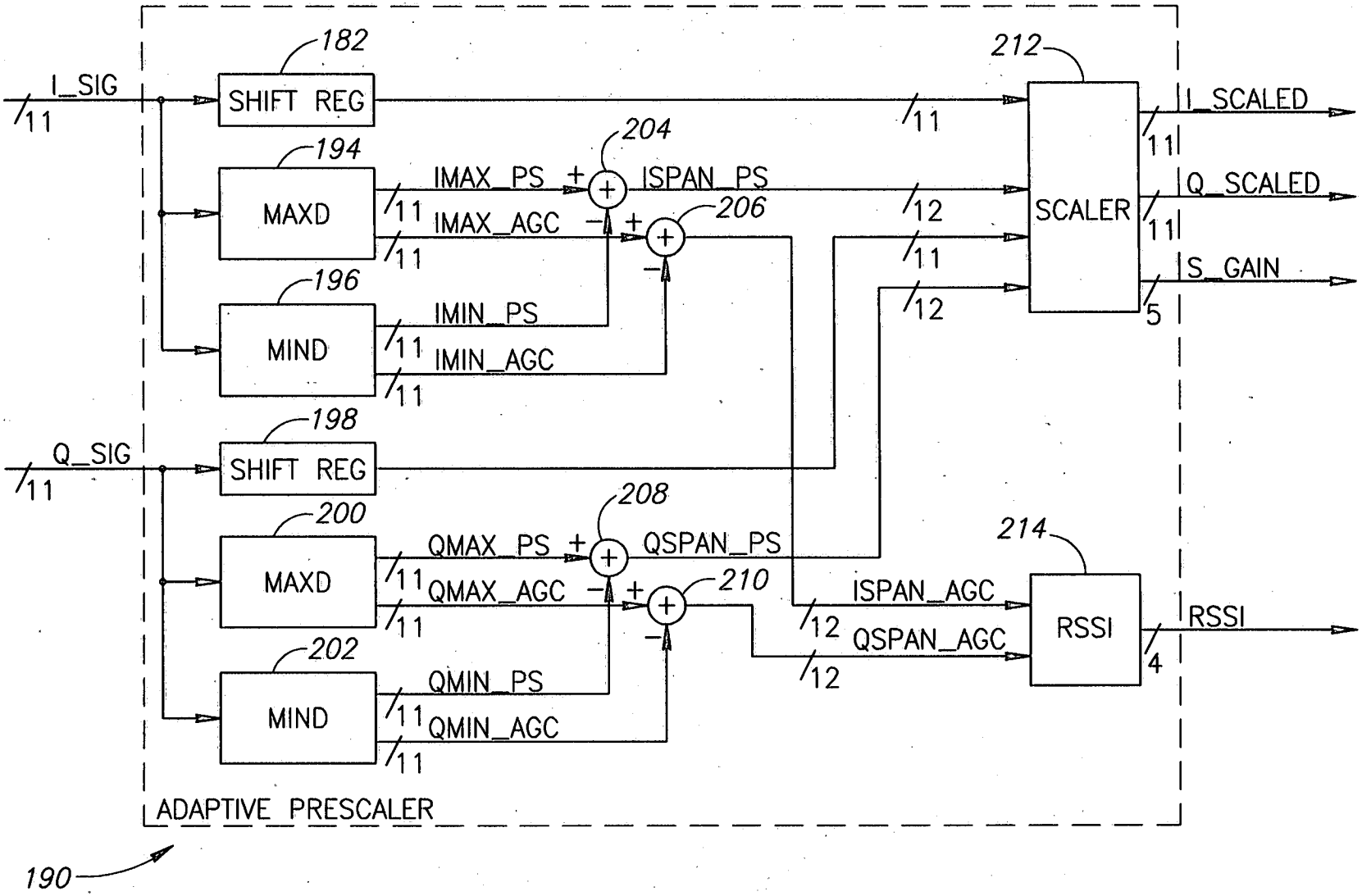
I_SIG
11
182
SHIFT REG
194
MAXD
196
MIND
IMAX_PS
IMAX_AGC
IMIN_PS
IMIN_AGC
204
206
ISPAN_PS
Q_SIG
11
198
SHIFT REG
200
MAXD
202
MIND
QMAX_PS
QMAX_AGC
QMIN_PS
QMIN_AGC
208
210
QSPAN_PS
212
SCALER
I_SCALED
Q_SCALED
S_GAIN
214
RSSI
ISPAN_AGC
QSPAN_AGC
RSSI
ADAPTIVE_PRESCALER
190

FIG.7

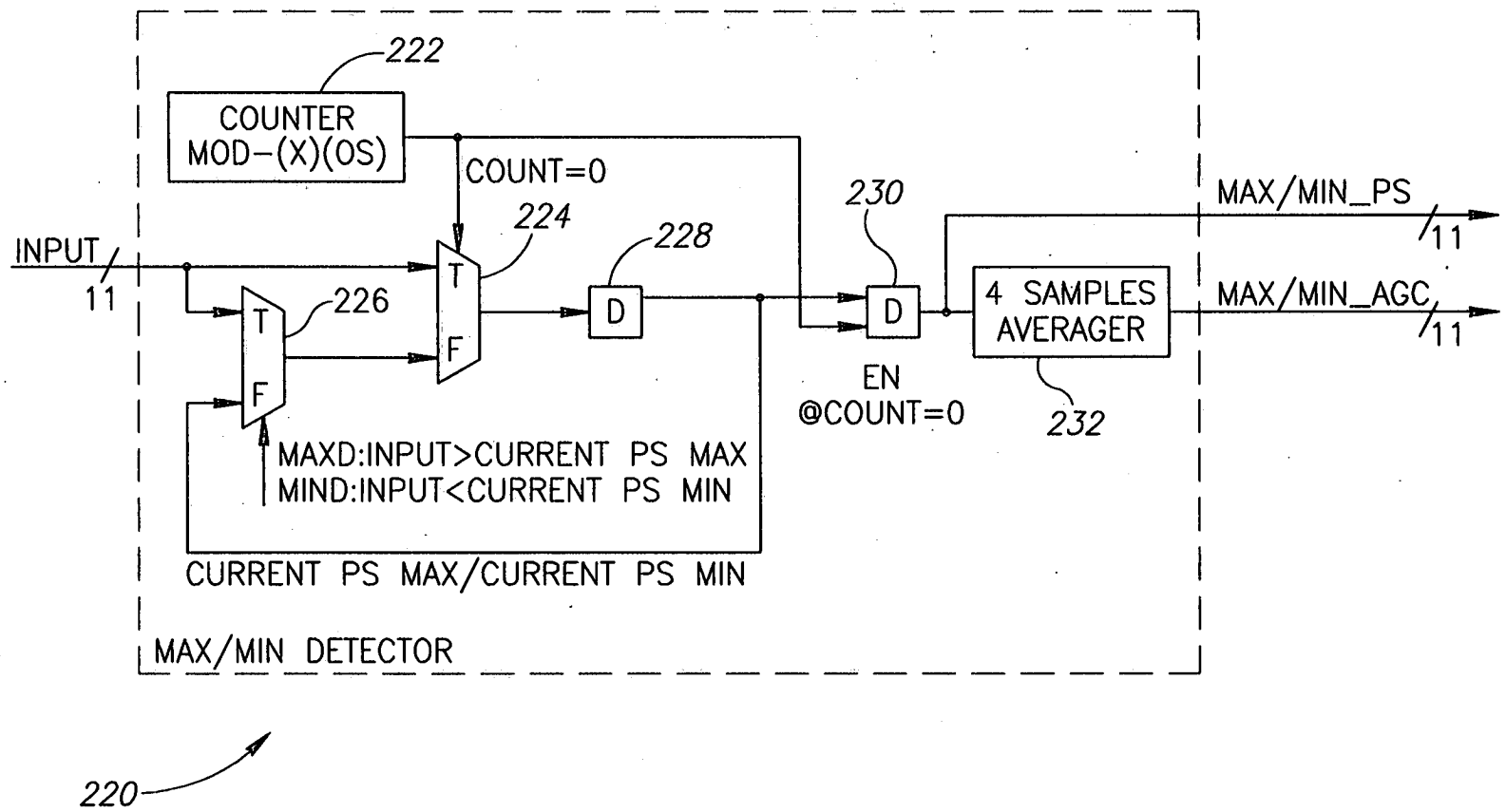
222
COUNTER
MOD-(X)(OS)
COUNT=0
224
228
230
MAX/MIN_PS
11
INPUT
11
T
F
226
T
F
D
D
4 SAMPLES
AVERAGER
MAX/MIN_AGC
11
EN
@COUNT=0
232
MAXD:INPUT>CURRENT PS MAX
MIND:INPUT<CURRENT PS MIN
CURRENT PS MAX/CURRENT PS MIN
MAX/MIN DETECTOR
220

FIG.8

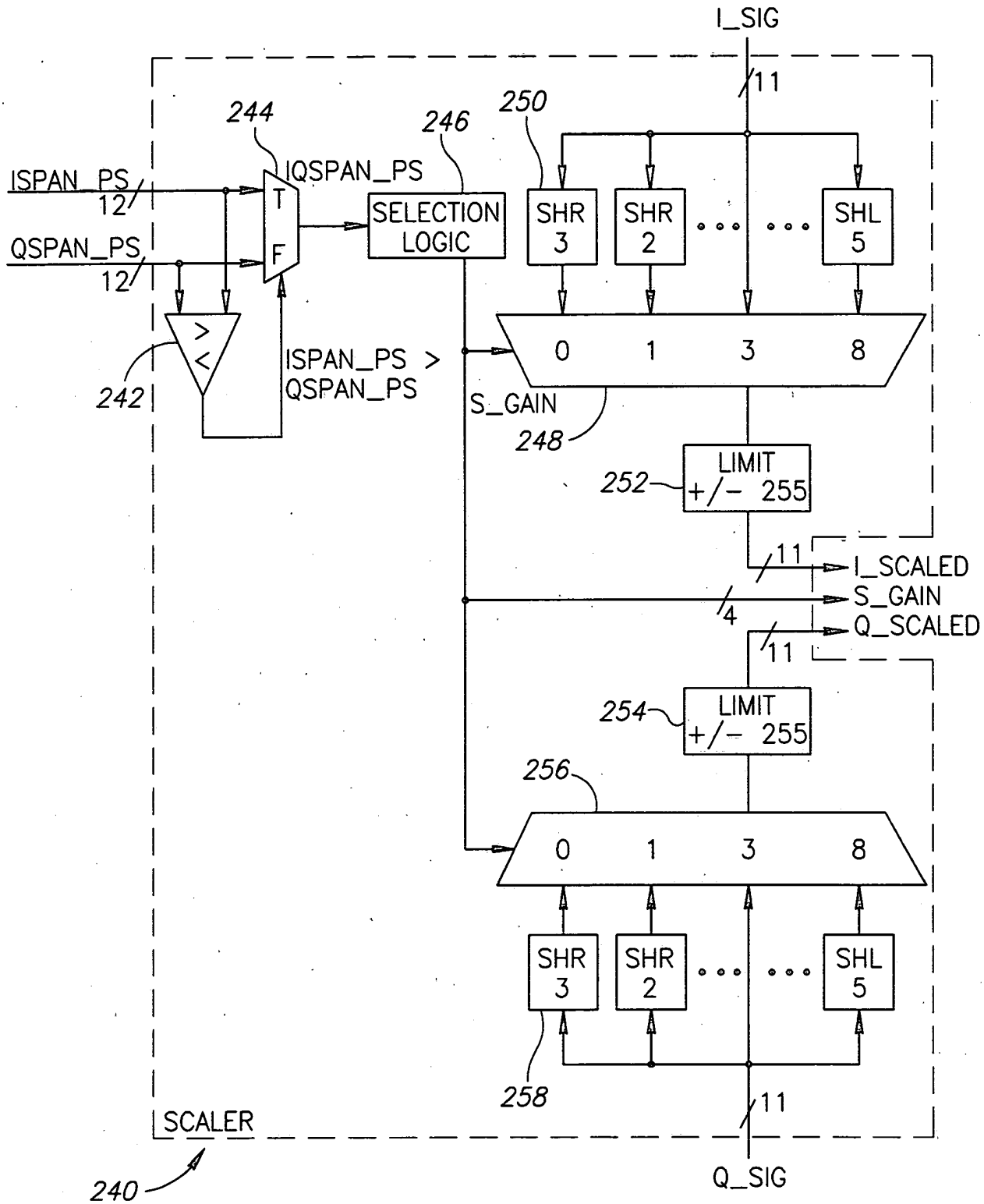
I_SIG
11
244
246
250
ISPAN_PS
12
QSPAN_PS
12
IQSPAN_PS
T
F
SELECTION LOGIC
SHR 3
SHR 2
SHL 5
0 1 3 8
S_GAIN
248
242
ISPAN_PS > QSPAN_PS
LIMIT +/- 255
252
11
I_SCALED
S_GAIN
4
Q_SCALED
11
254
LIMIT +/- 255
256
0 1 3 8
SHR 3
SHR 2
SHL 5
258
11
SCALER
240
Q_SIG

FIG.9

LISTING 2

```
IF IQSPAN(10)==1        % PEAK-TO-PEAK >=1024   (IQSPAN IS 12 BITS 11:0)
    S_GAIN = 0;
ELSEIF IQSPAN(9)==1     % PEAK-TO-PEAK >= 512
    S_GAIN = 1;
ELSEIF IQSPAN(8)==1     % PEAK-TO-PEAK >= 256
    S_GAIN = 2;
ELSEIF IQSPAN(7)==1     % PEAK-TO-PEAK >= 128
    S_GAIN = 3;
ELSEIF IQSPAN(6)==1     % PEAK-TO-PEAK >=  64
    S_GAIN = 4;
ELSEIF IQSPAN(5)==1     % PEAK-TO-PEAK >=  32
    S_GAIN = 5;
ELSEIF IQSPAN(4)==1     % PEAK-TO-PEAK >=  16
    S_GAIN = 6;
ELSEIF IQSPAN(3)==1     % PEAK-TO-PEAK >=   8
    S_GAIN = 7;
ELSE                    % PEAK-TO-PEAK <    0
    S_GAIN = 8;
END


IF ABS(S_GAIN-PREVIOUS_S_GAIN) <= 1
    S_GAIN=PREVIOUS_S_GAIN;
ELSEIF S_GAIN-PREVIOUS_S_GAIN == 2
    S_GAIN=PREVIOUS_S_GAIN+1;
ELSEIF S_GAIN-PREVIOUS_S_GAIN == -2
    S_GAIN=PREVIOUS_S_GAIN-1;
END
```

FIG.10